



Chicago Metropolitan  
Agency for Planning

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**Natural Area Protection and Water Quality  
Upper Kishwaukee River Watershed  
December 13, 2007**

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# Understanding the project

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- The watershed plans should:
  - Identify water quality protection / restoration needs and strategies
  - Identify roles for implementation (municipalities and other stakeholders)
- Municipalities will be asked to adopt the plans
- Illinois EPA will hold a public comment period and then incorporate the plans into the Areawide Water Quality Management Plan
- For a period of 5 – 7 years (until plan update), Illinois EPA must determine that municipalities are meeting their obligations under the plan before they are eligible for:
  - Low-interest financing for wastewater treatment plants
  - FPA expansion

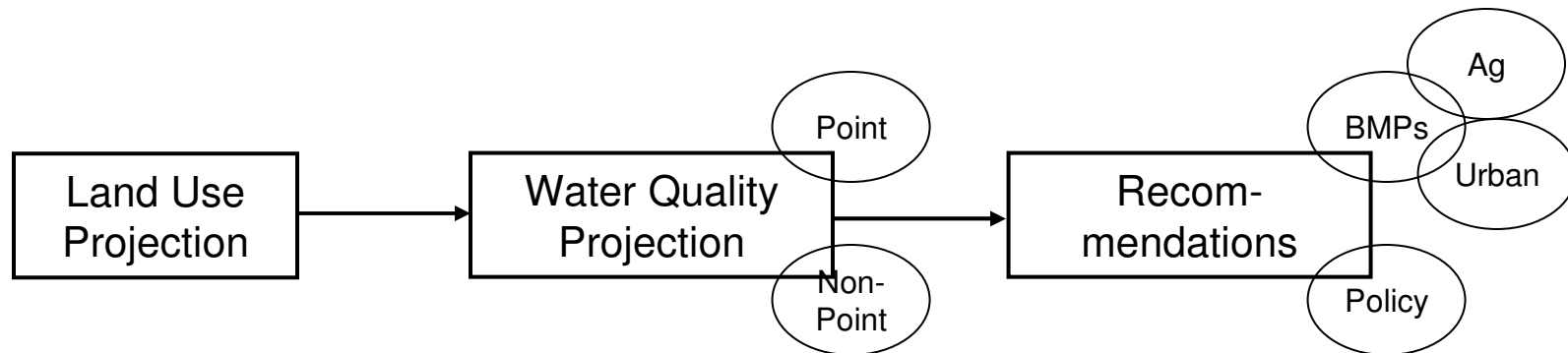
# Causes of impairment

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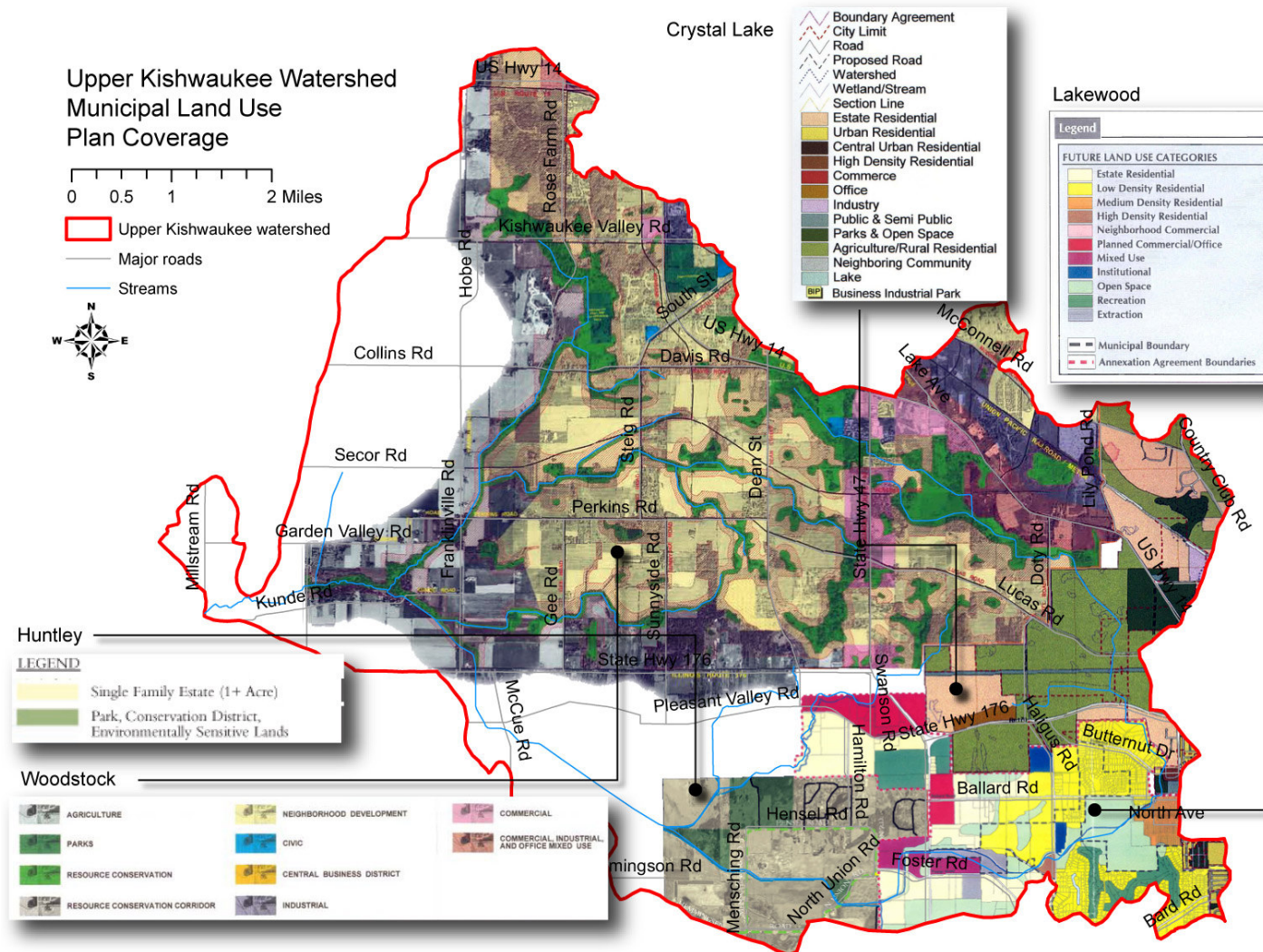
- Sedimentation
- Total nitrogen
- Alteration to streamside and littoral vegetative covers (habitat alteration)
- PCBs

# Process

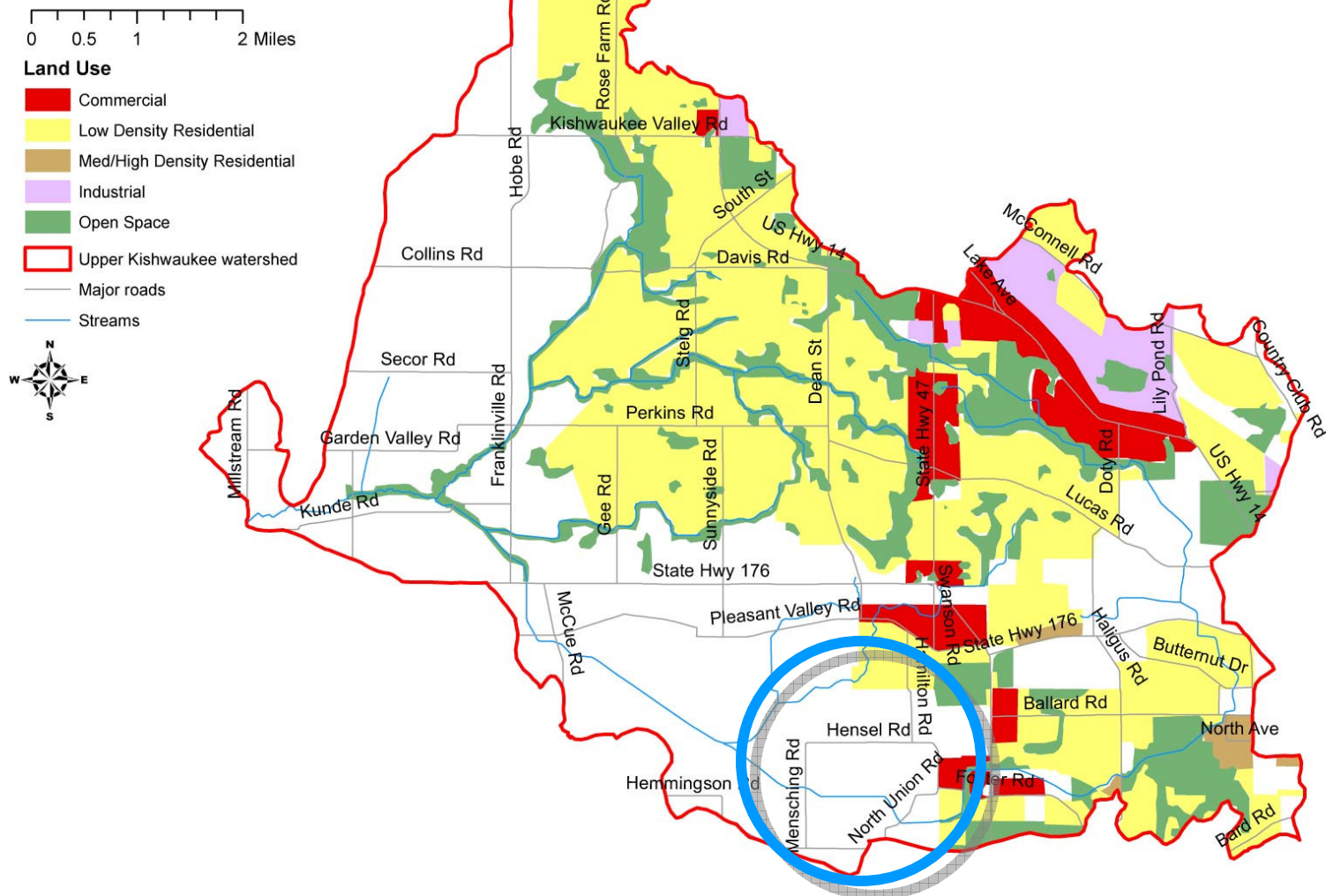
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# Future land use in municipal comprehensive plans + Huntley



## Recategorized Future Land Use in Municipal Comprehensive Plans



# Impairment Update

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Org	Date	IBI
IEPA	2006	34
MCCD	1999	40
IEPA	2001	23
MCCD	2001	32
MCCD	2001	40
MCCD	2001	44
Huff and Huff	2003	40
Huff and Huff	2003	40
Huff and Huff	2003	34
Huff and Huff	2003	40
Huff and Huff	2003	40

Mean =  $37 \pm 3.5$  (95% confidence)  
Median = 40

Change needed = 11 to 22%

# Natural Area Conservation

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- Also known as:
  - Open Space Protection
  - Green Infrastructure
- That portion of a landscape or watershed where naturally occurring ecosystem functions produce services that society values.

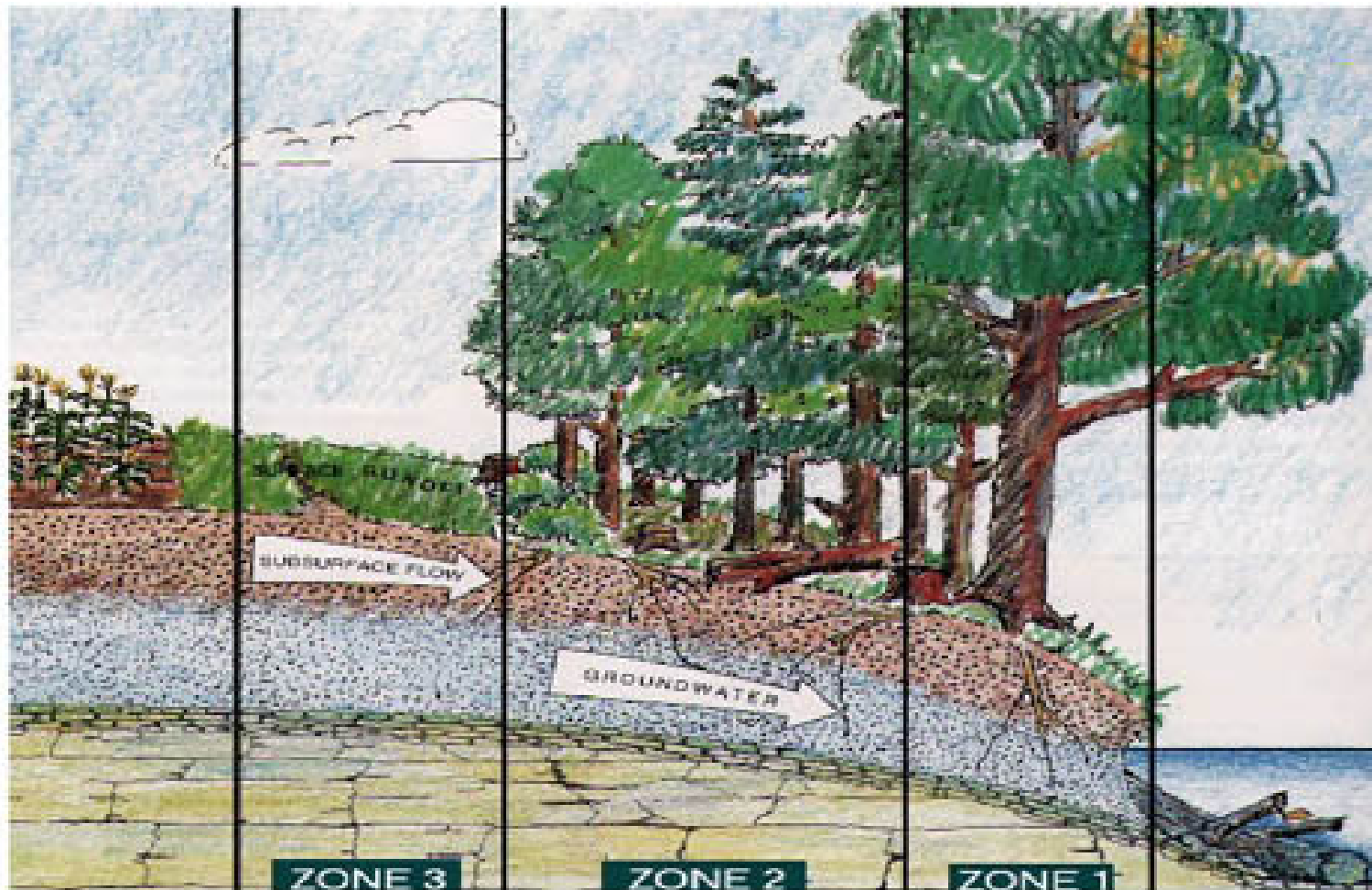


# Natural Area Conservation

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- There's the riparian zone...
  - The area immediately adjacent to streams
  - “Last line of defense”
  - Flood protection along higher-order streams,
  - Habitat protection for both terrestrial and aquatic species
- ...And there's everything else.

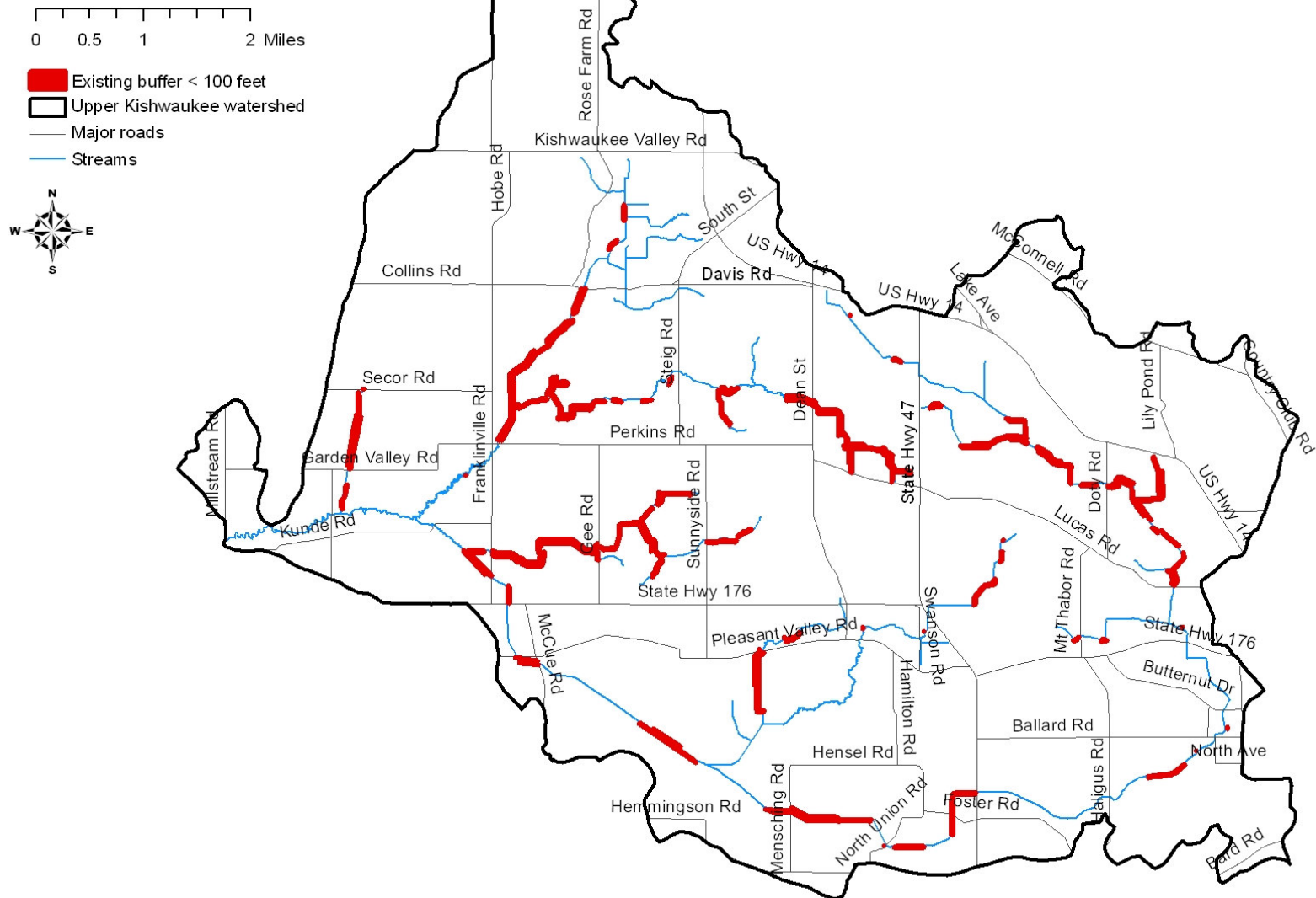
## Riparian buffer function for mitigating agricultural pollution



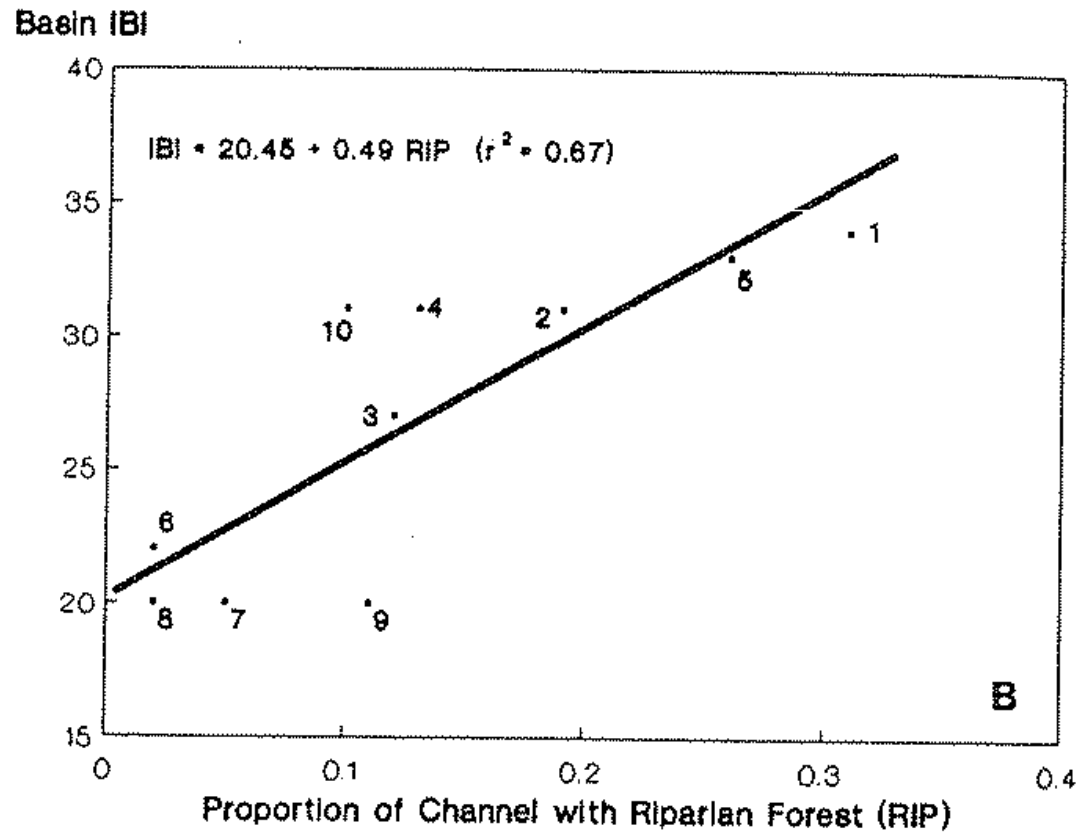
Riparian buffer zones are considered potential sites for natural groundwater contaminant remediation. However, they do not always function as predicted.

# Riparian corridor needs

## Riparian Corridor Buffer Needs in Upper Kishwaukee Watershed



# Research



# Beyond the riparian zone

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- How do we identify those areas?
  - McHenry County Conservation District
  - The Land Conservancy of McHenry County
  - Kishwaukee River Ecosystem Partnership
  - Other Stakeholders (e.g. McHenry County, Villages)

# Natural Area Conservation

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- Criteria to consider:
  - water quality
  - other goals
    - e.g. habitat, flood protection, wetland restoration, other community type restoration / conservation, water supply protection, recreation
- Order of importance?

# Natural Area Conservation

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Land use is:

Changing

Static

Main role played by:

Municipalities

Landowners

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Conservation design  
Transfers to land management agencies

# Natural Area Conservation

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Data requirements –

- current / recent aerial photography

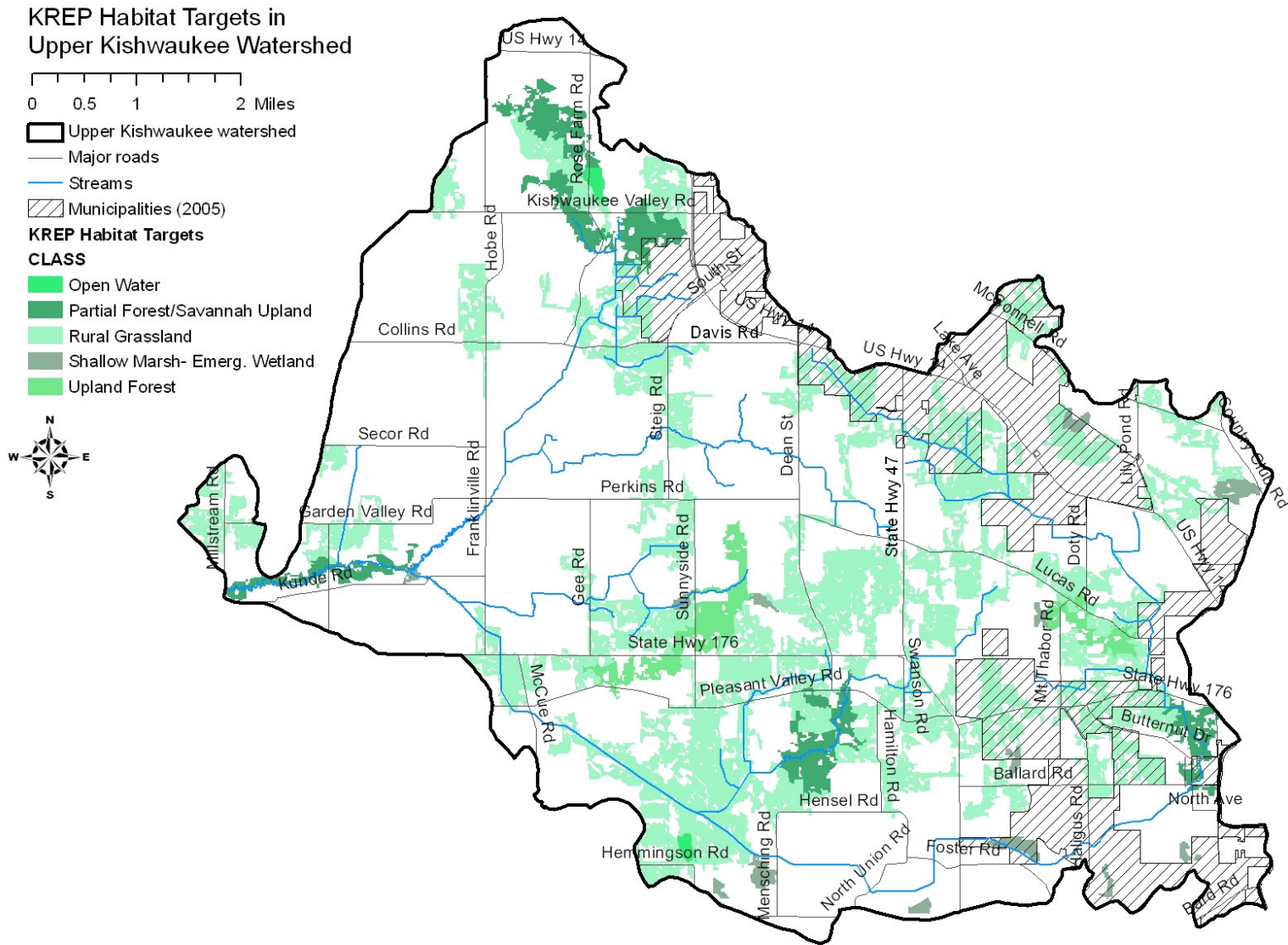
- natural resources

- Digital elevation model (DEM)

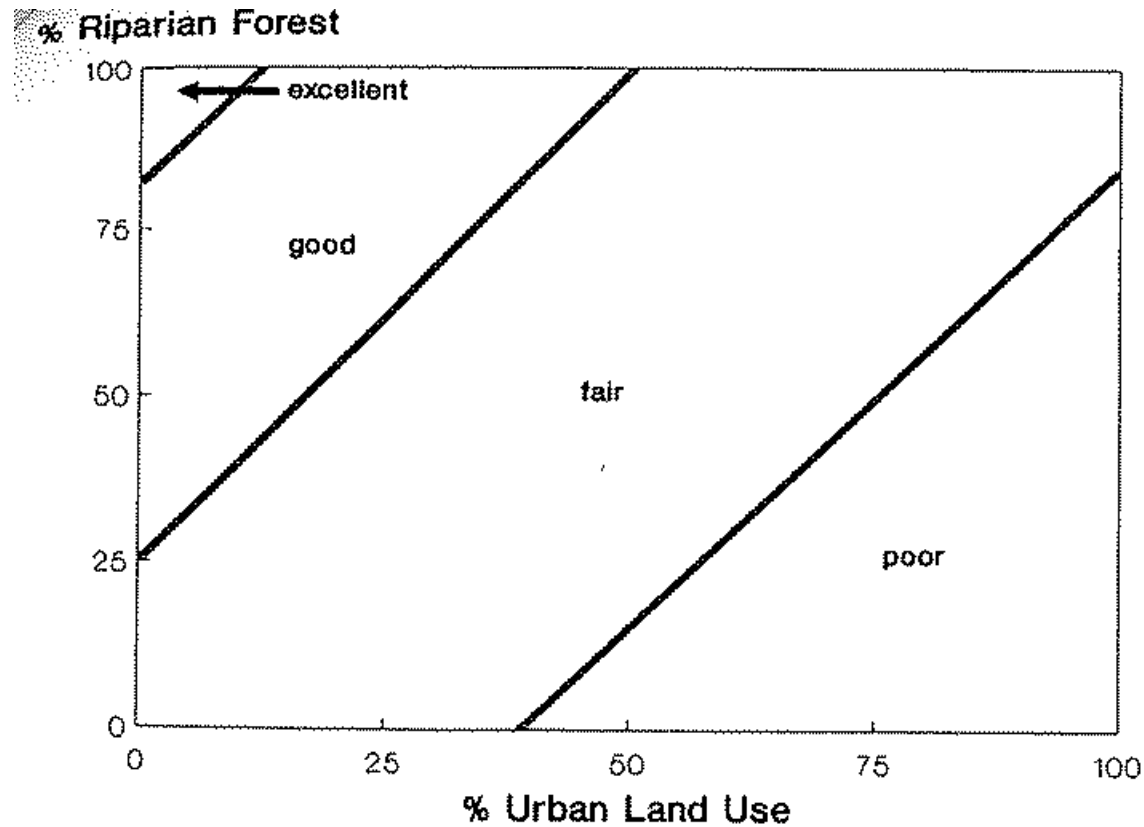
- cadastral



# Example natural resource layer



# Open space and IC percentage



# Sources STEPL considers

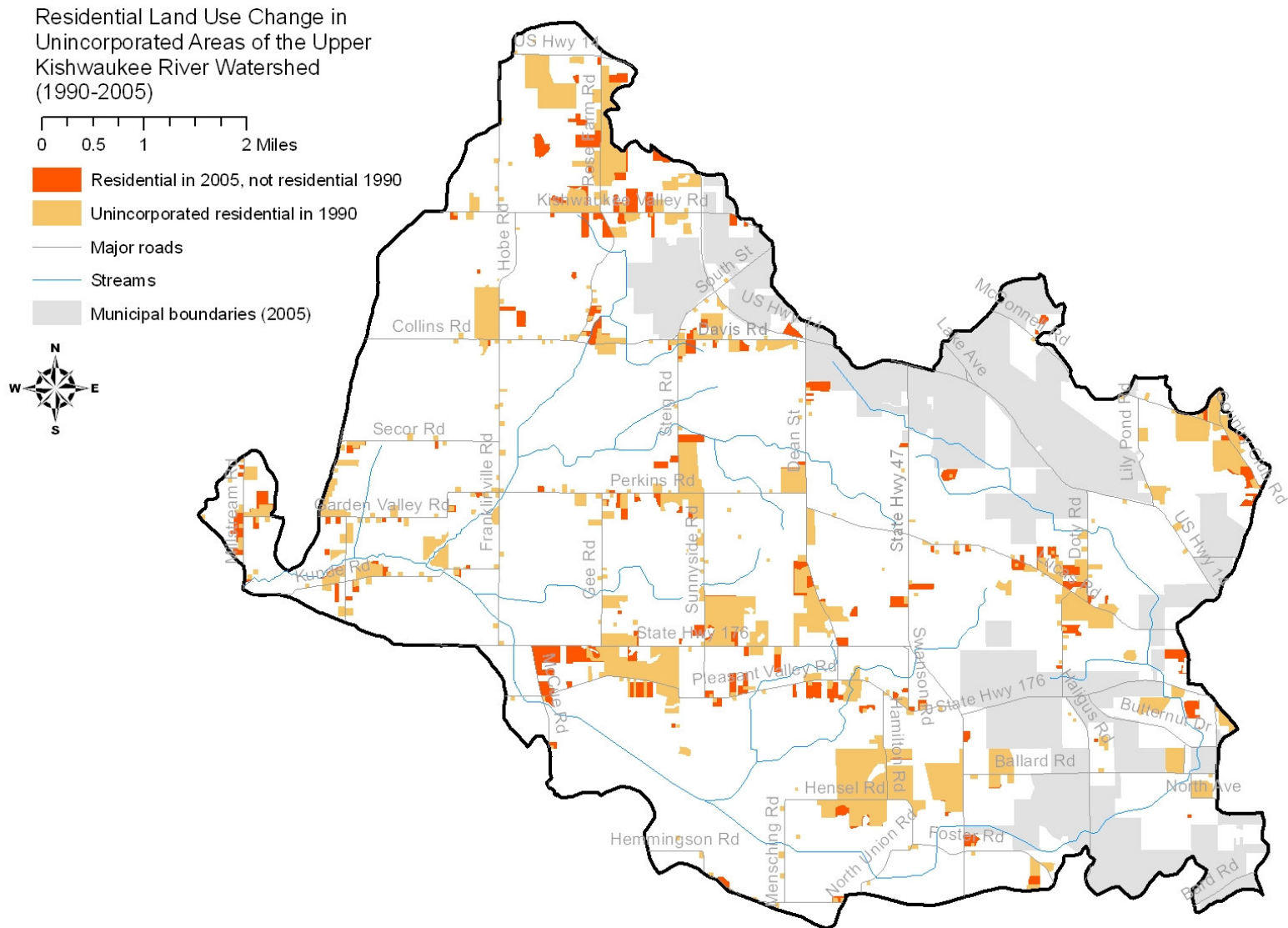
Cause	Potential source	
Sedimentation	Sheet erosion Streambank erosion	
Nitrogen	Wastewater Septic tanks Livestock Nitrogen in eroded soil Urban runoff	Separate analysis
Riparian habitat alteration	—	Separate analysis

# Septic system analysis

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- 1990 Census by block group: type of sewage disposal of each housing unit
- Aggregate to subwatershed
- Assume all septic systems installed between 1990 and 2005 were for residential development in unincorporated areas
- Use land use change from 1990 to 2005 to estimate number of new septic systems

# Unincorp. residential 1990 - 2005



# Septic systems by subwatershed

Percent of Septic Systems by Subwatershed in  
Upper Kishwaukee River Watershed

